IN THE SPECIFICATION

[0028] The invention further provides a rechargeable electrochemical cell charging system having (1) an electrochemical cell comprising (a) an outer can defining an internal cavity with an open end, and anode and cathode disposed in the internal cavity, and a terminal end cap enclosing the open end; (b) a linkage that establishes an electrical connection between the terminal end cap and the first electrode; and (c) a switch responsive to high pressure to break the linkage; and (2) a cell charger that receives the electrochemical cell and supplies a constant voltage charge thereto, wherein internal pressure is generated during charging that activates the switch to terminate the charge when the internal pressure exceeds a predetermined pressure threshold.~~,~~ In another aspect, the charger supplies an alternating current charge. In another aspect, the charger supplies a voltage charge that varies between a predetermined maximum threshold and a predetermined minimum threshold.

[0068] Referring now to Fig. 2A, an axially extending cell includes a can 12 having closed end (not shown) and an open end 13 disposed opposite the ~~open~~ closed end and axially downstream therefrom. A cap assembly 10 includes a positive terminal end cap 18 that is secured in the open end of the negative can 12 to provide closure to the cell. In particular, the end cap assembly 10 and the open end of the can 12 are adapted in size and shape such that the end cap assembly 10 is sealingly accommodated in the open end by crimping the negative can 12 during assembly of a cylindrical rechargeable metal hydride cell. The closed end of the can is conventional and is not shown.

[0070] The positive terminal cap 18 has a nipple 20 that is sized and shaped to provide a positive terminal to the cell having a pressure-responsive switch 11 constructed in accordance with the present invention. The pressure-responsive switch 11 comprises a flexible non-conductive mono-stable grommet 22 adapted in size and shape to fit securely in the open end ~~13~~. Grommet includes a radially outer seal 25, an inner hub 27, and an arm 29 that extends substantially radially and connects the seal to the hub. Grommet 22 further includes ~~has~~ a centrally disposed opening 15 extending axially through the hub 27 in which is seated a conductive spool-shaped connector 24 having a pair of oppositely disposed radially extending outer flanges 23. The space between the outer surface of grommet 22 and inner surface of terminal end cap 18 defines a cavity 17 in the end cap assembly 10.

[0071] Connector 24 is securely fixed in the opening of grommet 22 such that the conductive connector moves in concert with the grommet. A first annular conductive contact 26, which is a metal washer in accordance with the illustrated embodiment, surrounds the hub of connector 24 and has an upper surface in electrical contact with the upper flange 23. A second annular conductive contact 28 (which can also be a metal washer) surrounds the grommet and is positioned axially upstream and adjacent the first contact 26. The first and second contacts 26, 28 are circular plates in Fig. 2A but they can be provided in other shapes, as illustrated, for example, in Figs. 3-5. Contact 28 has an upper surface ~~29~~ that is in electrical connection with the terminal cap, and in removable mechanical (and therefore electrical) connection with the bottom surface of the first contact 26, as will become more apparent from the description below.

[0139] The resistance R of strain gauge 214 may be determined by supplying an electrical current to contact bands 216, and measuring the drop in voltage across strain gauge 214. Alternatively, and as is appreciated by those having ordinary skill in the art, a bridge circuit may be used to amplify the signal changes from strain gauge 214. The resistance is constantly sampled during charging until ~~its~~ the rate of change meets a predetermined threshold criteria, thus indicating the charge termination point. At this time, an indicator on charger 218 (not shown) may be activated to alert a user, and the charger will be discontinue its charging current from the battery 210. Accordingly, a reliable indicator is provided for indicating a charge termination point for fast charging assemblies, which may fully charge a depleted battery in less than 230 minutes.